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What is claimed is:

1. A storage area network (\$AN) comprising:

a network interconnection system;

at least one machine selected from the group consisting of a host and an appliance, the machine coupled to the network interconnection system;

at least one storage system coupled to the network interconnection system;

a network management system;

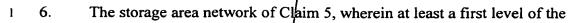
wherein the network/management system further comprises:

at least one management client; and

at least one integrated management agent running on a machine of the at least one machine; and

wherein the integrated management agent comprises an object manager configured such that the integrated management agent is expandable to support an additional network device types by installing device type-specific modules while the integrated management agent is running.

- 2. The storage area network of Claim 1, wherein the integrated management agent further comprises a consistent user interface module, and wherein the consistent user interface module supports a web-based and a Windows-based user interface.
- The storage area network of Claim 1, wherein the integrated management agent further comprises and a consistent user interface module coupled to the object manager, wherein at least one device type-specific module is installed, and wherein the at least one device type-specific module further comprises a device handler for coupling a storage system to the integrated management agent.
- 1 4. The storage area network of Claim 3, wherein at least one device type-specific 2 module further comprises code for supporting a plurality of protocols to communicate 3 with a plurality of devices.
- The storage area network of Claim 4, wherein the management system further comprises a distributed error and status handler capable of handling error and status information from at least one device.



- distributed error and status handler executes on the at least one device.
- The storage area network of Claim 5, wherein at least one machine selected
- 2 from a group consisting of a host and an appliance, incorporates a second level of
- 3 error and status handler.
- 1 8. The storage area network of Claim 5, wherein the distributed error and status
- 2 handler further comprises a centralized global error and status handler level.
- 1 9. The storage area network of Claim 8, wherein the centralized global error and
- status handler level executes upon a fault tolerant system in a storage are network
- 3 management environment.
- 1 10. The storage area network of Claim 1, wherein the integrated management
- 2 agent further comprises a trap handler coupled to a notification module to receive
- 3 traps from at least one SAN device and send notification to at least one system
- 4 administrator.
- 1 11. The storage area network of Claim 10, wherein the integrated management
- agent further capable of sending traps to support at least a second management
- 3 system.
- 1 12. The storage area network of Claim 1, wherein the integrated management
- 2 system is capable of being configured with a configuration utility.
- 1 13. The storage area network of Claim 1, wherein the object manager further
- 2 comprises a dynamic list indicating device types the integrated management agent is
- 3 capable of handling, wherein installing device type-specific modules causes addition
- of device types to the dynamic list, and wherein addition of device types to the
- 5 dynamic list does not require shutting down the integrated management agent.
- 1 14. The storage area network of Claim 13, wherein the network interconnection
- 2 system further comprises at least one fibre channel switch, and wherein a device type-
- 3 specific module is type specific to the at least one fibre channel switch.



- 2 system further comprises a firmware download module with unified user interface
- 3 hiding device specific firmware download process and characteristics from the
- 4 administrator.
- 1 16. The storage area network of Claim 1, wherein the integrated management
- agent is capable of discovering devices and agents in the SAN and their
- interconnection by applying a conglomerate method comprising at least two elements
- 4 selected from the group consisting of host and device agent broadcasting, multicasting
- device identity, collecting addresses from network traffic, collecting information from
- a name server, scanning a set of ranges of address supplied in configuration
- 7 information, and dollecting information about devices from configuration information.
- 1 17. The storage area network of Claim 1, wherein the integrated management
- agent further capable of discovering devices and agents in the SAN and their
- interconnection by applying a conglomerate method comprising at least three
- 4 elements selected from the group consisting of host and device agent broadcasting,
- 5 multicasting device identity, collecting addresses from network traffic, collecting
- 6 information from a name server, scanning a set of ranges of address supplied in
- 7 configuration information, and collecting information about devices from
- 8 configuration information.